UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/670,124	09/26/2000	Wai-Chung Chan	115426-892	5665

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EXAMINER
DUONG, THOMAS

ART UNIT	PAPER NUMBER
2145	

DATE MAILED: 02/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/670,124	CHAN ET AL.
	Examiner	Art Unit	
	Thomas Duong	2145	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2005*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   This office action is in response to the applicants Amendment filed on October 7, 2005.

Claims 1-39 are presented for further consideration and examination.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by
another filed in the United States before the invention by the applicant for patent or (2) a patent
granted on an application for patent by another filed in the United States before the invention by the
applicant for patent, except that an international application filed under the treaty defined in section
351(a) shall have the effects for purposes of this subsection of an application filed in the United States
only if the international application designated the United States and was published under Article 21(2)
of such treaty in the English language.

3.   *Claims 1, 11, 21, and 29* are rejected under 35 U.S.C. 102(e) as being anticipated by

Douceur et al. (US006247061B1).

4.   With regard to *claims 1, 11, 21, and 29*, Douceur discloses,

- *retrieving a search order table specifying order for servicing of M queues, the*

  search order table having a plurality of table entries corresponding to the M

  queues that selectively store the packets, the table entries storing values that

  specify relative positions of the M queues and that are selected based upon a

  transmission constraint of the communication system; and (Douceur, col.2, line

  51 – col.4, line 16; col.13, lines 24-56)

Douceur teaches of *"a flexible packet scheduling mechanism that supports multiple scheduling algorithms ... to deliver packets from a packet flow over communications in such a manner that service quality requirements for a data stream are met"* (Douceur, col.2, lines 51-57). Specifically, Douceur teaches of a *"sequencer component [that] maintains priority lists of packet flow queues and will service the highest priority queue list followed by each successive priority list until no packets remain for transmission"* (Douceur, col.3, lines 61-65). Furthermore, according to Douceur, *"each priority list will have a queue discipline associated therewith that will determine in what order the packets are taken off the respective flow queues"* (Douceur, col.3, line 66 – col.4, line 1). Hence, Douceur teaches of a transmission method to be used in a communication network where the transmission queues are scheduled for transmission based on a priority list, which ultimately is ordered based on a constraint or queue discipline.

- *scheduling transmission of the packets stored in the M queues based upon the search order table.* (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56) Douceur teaches of *"a flexible packet scheduling mechanism that supports multiple scheduling algorithms ... to deliver packets from a packet flow over communications in such a manner that service quality requirements for a data stream are met"* (Douceur, col.2, lines 51-57). Specifically, Douceur teaches of a *"sequencer component [that] maintains priority lists of packet flow queues and will service the highest priority queue list followed by each successive priority list until no packets remain for transmission"* (Douceur, col.3, lines 61-65). Furthermore, according to Douceur, *"each priority list will have a queue discipline*

associated therewith that will determine in what order the packets are taken off

the respective flow queues" (Douceur, col.3, line 66 – col.4, line 1). Hence,

Douceur teaches of a transmission method to be used in a communication

network where the transmission queues are scheduled for transmission based on

a priority list, which ultimately is ordered based on a constraint or queue

discipline.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   *Claims 2-10, 12-20, 22-28, 30-39* are rejected under 35 U.S.C. 103(a) as being

unpatentable over Douceur et al. (US006247061B1) and in view of Prieto, Jr. et al.

(US006738346B1).

7.   With regard to *claims 2, 12, and 30*, Douceur discloses,

        See *claims 1, 11, and 29* rejection as detailed above.

        However, Douceur does not explicitly disclose,

        •   *wherein the M queues corresponds to different transmission regions, and the*

             transmission constraint in the retrieving step specifies that the packets are to be

             transmitted to the transmission regions that are non-interfering, the

             communication system being a satellite communication system.

Prieto teaches,

- *wherein the transmission constraint in the retrieving step specifies that the packets are to be transmitted to a plurality of destination nodes that are non-interfering, the communication system being a satellite communication system.* (Prieto, col.1, line 62 – col.2, line 8; col.3, line 55 – col.4, line 65) Prieto teaches of *"a downlink scheduler ... provided for scheduling the downlink transmission of data cells in a spot beam processing satellite. The downlink scheduler includes a beam selector for selecting one of the spot beams associated with the satellite ... and [passing] at least one data cell from a selected retail connection to a downlink modulator"* (Prieto, col.1, line 62 – col.2, line 8). Furthermore, according to Prieto, *"each queue corresponds to a different beam and thus a different geographic area to be illuminated. Each queue [also] includes a buffer and a service discipline"* (Prieto, col.4, lines 39-42). Hence, Prieto teaches of a satellite communication network that has queues corresponding to different transmission beams and thus a different transmission region or area.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Prieto and the teachings of Douceur to *"provide an innovative hierarchical scheme for scheduling data cell throughput from the cell switch to the downlink modulator in a satellite system. A downlink scheduler implementing such a scheme will thus provide more efficient and fair scheduling of downlink resources, while maintaining certain Quality of Service guarantees"* (Prieto, col.1, lines 50-56). According to Prieto, *"by dynamically scheduling the beam hop based on actual user demand, subscription rates, and QoS*

constraints, the beam selection stage makes efficient use of bandwidth not possible
with the conventional fixed tables approach" (Prieto, col.4, lines 49-53).

8.   With regard to *claims 3, 13, 22 and 31,* Douceur and Prieto disclose,

- *transmitting the packets via N number of transmitters, wherein N is less than or
  equal to M.* (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto,
  col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)

9.   With regard to *claims 4-6, 14-16, 23-24 and 32-34,* Douceur and Prieto disclose,

- *(a) checking whether a particular one of the M queues has a packet stored
  therein and satisfies the transmission constraint;* (Douceur, col.2, line 51 – col.4,
  line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51;
  col.3, line 55 – col.4, line 65)
- *(b) selectively including the particular queue in a transmission list based upon the
  checking step; and* (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56;
  Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line
  65)
- *(c) iteratively performing steps (a) and (b) until at least one of each of the M
  queues is checked and N number of the queues are included in the transmission
  list.* (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto, col.1, line
  62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)

10.   With regard to *claims 7-8, 17-18, 25-26 and 35-36,* Douceur and Prieto disclose,

- *wherein the search order table in the retrieving step has L consecutive table entries associated with L queues that satisfy another transmission constraint. (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)*

- *wherein the transmission constraint in the retrieving step specifies that the packets are to be transmitted to a plurality of destination nodes that are non-interfering, and the other transmission constraint specifies that only one of the destination nodes selectively requires high-powered transmission. (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)*

11.   With regard to *claims 9-10, 19-20, 27-28 and 37-38,* Douceur and Prieto disclose,

- *inputting repetitive table entry values in the search order table based upon relative traffic load associated with a plurality of destination nodes. (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)*

- *generating a plurality of search order tables based upon a plurality of power constraints associated with the communication system; storing the plurality of search order tables: and selecting a particular one of the plurality of search order tables. (Douceur, col.2, line 51 – col.4, line 16; col.13, lines 24-56; Prieto, col.1, line 62 – col.2, line 8; col.2, lines 40-51; col.3, line 55 – col.4, line 65)*

12.   With regard to _claim 39_, Douceur discloses,

- *scheduling transmission of the packets stored in a plurality of queues based*

     upon a search order table specifying order for non-sequential servicing of the

     queues corresponding respectively to a plurality of nodes, wherein the search

     order table has a plurality of table entries corresponding to the queues, the table

     entries storing values that specify relative positions of the queues according to a

     transmission constraint relating to the nodes; and (Douceur, col.2, line 51 – col.4,

     line 16; col.13, lines 24-56)

     Douceur teaches of *"a flexible packet scheduling mechanism that supports*

     multiple scheduling algorithms ... to deliver packets from a packet flow over

     communications in such a manner that service quality requirements for a data

     stream are met" (Douceur, col.2, lines 51-57). Specifically, Douceur teaches of a

     "sequencer component [that] maintains priority lists of packet flow queues and

     will service the highest priority queue list followed by each successive priority list

     until no packets remain for transmission" (Douceur, col.3, lines 61-65).

     Furthermore, according to Douceur, *"each priority list will have a queue discipline*

     associated therewith that will determine in what order the packets are taken off

     the respective flow queues" (Douceur, col.3, line 66 – col.4, line 1). Hence,

     Douceur teaches of a transmission method to be used in a communication

     network where the transmission queues are scheduled for transmission based on

     a priority list, which ultimately is ordered based on a constraint or queue

     discipline.

     However, Douceur does not explicitly disclose,

- *transmitting the packets to the nodes over one or more satellite links according to the servicing of the ordered queues.*

Prieto teaches,

- *transmitting the packets to the nodes over one or more satellite links according to the servicing of the ordered queues.* (Prieto, col.1, line 62 – col.2, line 8; col.3, line 55 – col.4, line 65)

  Prieto teaches of *"a downlink scheduler ... provided for scheduling the downlink transmission of data cells in a spot beam processing satellite. The downlink scheduler includes a beam selector for selecting one of the spot beams associated with the satellite ... and [passing] at least one data cell from a selected retail connection to a downlink modulator"* (Prieto, col.1, line 62 – col.2, line 8). Furthermore, according to Prieto, *"each queue corresponds to a different beam and thus a different geographic area to be illuminated. Each queue [also] includes a buffer and a service discipline."* (Prieto, col.4, lines 39-42). Hence, Prieto teaches of a satellite communication network that has queues corresponding to different transmission beams and thus a different transmission region or area.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Prieto and the teachings of Douceur to *"provide an innovative hierarchical scheme for scheduling data cell throughput from the cell switch to the downlink modulator in a satellite system. A downlink scheduler implementing such a scheme will thus provide more efficient and fair scheduling of downlink resources, while maintaining certain Quality of Service guarantees"* (Prieto, col.1, lines 50-56). According to Prieto, *"by dynamically*

scheduling the beam hop based on actual user demand, subscription rates, and QoS

constraints, the beam selection stage makes efficient use of bandwidth not possible

with the conventional fixed tables approach" (Prieto, col.4, lines 49-53).

Response to Arguments

13.   Applicant's arguments with respect to *claims 1, 11, 21, and 29* have been considered but

they are not persuasive.

14.   With regard to <u>claims 1, 11, 21, and 29</u>, the Applicants point out that:

- *It should be noted that the Douceur et al. system has no capability of maintaining*

   the claimed search order table, as the Douceur et al. system utilizes multiple

   priority lists for scheduling transmissions of packets within the flow queues.

   Furthermore, the priority list cannot store "values that specify relative positions of

   the plurality of queues," as it merely specifies the queues that have been

   designated with the particular priority. As anticipation under 35 U.S.C. 102

   requires that each and every element of the claim be disclosed in a prior art

   reference, based on the foregoing, it is clear that Douceur et al. does not

   anticipate claims 1, 11, 21 and 29.

However, the Examiner finds that the Applicants' arguments are not persuasive

because according to Douceur, *"each priority list will have a queue discipline*

associated therewith that will determine in what order the packets are taken off the

respective flow queues" (Douceur, col.3, line 66 – col.4, line 1). Therefore, Douceur

anticipates that, for a particular priority list (e.g., high, low), the order of the packets

to be processed is determined by the priority list. Hence, Douceur teaches of a

transmission method to be used in a communication network where the transmission

queues are scheduled for transmission based on a priority list, which ultimately is

ordered based on a constraint or queue discipline.

Therefore, the Applicants still failed to clearly disclose the novelty of the invention

and identify specific limitation, which would define patentable distinction over prior
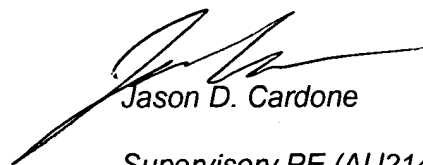
art.

Conclusion

15.   **THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as

set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is

set to expire THREE MONTHS from the mailing date of this action. In the event a first

reply is filed within TWO MONTHS of the mailing date of this final action and the

advisory action is not mailed until after the end of the THREE-MONTH shortened

statutory period, then the shortened statutory period will expire on the date the advisory

action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated

from the mailing date of the advisory action. In no event, however, will the statutory

period for reply expire later than SIX MONTHS from the date of this final action.

16.   Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Thomas Duong whose telephone number is 571/272-3911. The

examiner can normally be reached on M-F 7:30AM - 4:00PM. If attempts to reach the

examiner by telephone are unsuccessful, the examiner's supervisor, Jason D. Cardone

can be reached on 571/272-3933. The fax phone numbers for the organization where

this application or proceeding is assigned are 571/273-8300 for regular communications

and 571/273-8300 for After Final communications.

Thomas Duong (AU2145)   *Jason D. Cardone*

January 6, 2006   *Supervisory PE (AU2145)*